

Meaningful Watershed Educational Experience

South Side

Student Journal

Name _____



Hanover-Caroline Soil & Water Conservation District

in cooperation with

Hanover County Public Schools and Caroline County Public Schools

South Side Field Journal Table of Contents

Parking Lot Student Data Card	1
Wetlands: Wetlands Café.....	4
Wetlands: Dig It	6
Wetlands: Go Green!	8
Field Notes Station: Is There Still Room for Wildlife?	10
Field Notes Station: A Sense of Place.....	12
Student Water Quality Testing Data Card.....	15
Additional Notes Page.....	16

Parking Lot Student Data Card

1. Air Temperature (in degrees Celsius)

<i>A. Air Temperature at Waist Height</i>	<i>B. Air Temperature at Parking Lot Surface</i>	<i>C. Air Temperature at Bio-Swale Surface</i>
_____	_____	_____
Difference	$B - A =$ _____	$B - C =$ _____

Was there a difference in air temperature between the surface of your parking space and the bio-swale?

If so, what do you think contributes to this difference in air temperature?

2. Water Temperature

<i>Water Temperature in degrees Celsius</i>	<i>Maximum DO for temperature in ppm (use EPA graph)</i>
Water in one gallon jug _____	_____
Water poured across pavement (over pollution samples and collected at the low point of parking space) _____	_____
Difference in temperature _____	Difference in ppm _____

Based on your results of your team's water temperature comparison, how would you rate the threat of thermal pollution (from this parking lot) today?

_____ High _____ Moderate _____ Low

3. Pollution Transport

Scatter the pollution samples on the pavement and then pour the water at the top of the parking space.

Did the water move the pollution samples?

_____ Yes _____ No _____ Partially

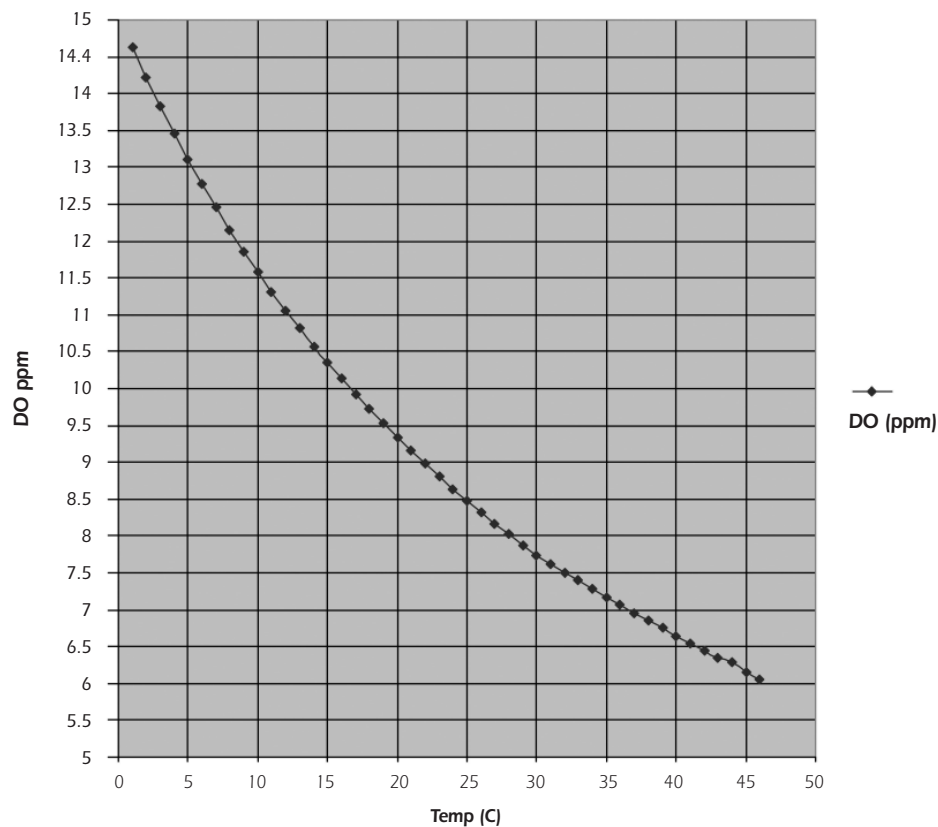
If yes, or partially, measure and record how far the major portion of the substance(s) was transported.

_____ (ft./in.)

If the substances were transported all the way to the bio-swale, what happened when the water reached the bio-swale?

In addition to temperature modification, what other benefits of the bio-swale (vegetative strip) do you think there may be in terms of the transportation of substances off the parking lot?

Max DO Levels to Temperature According to EPA Standards



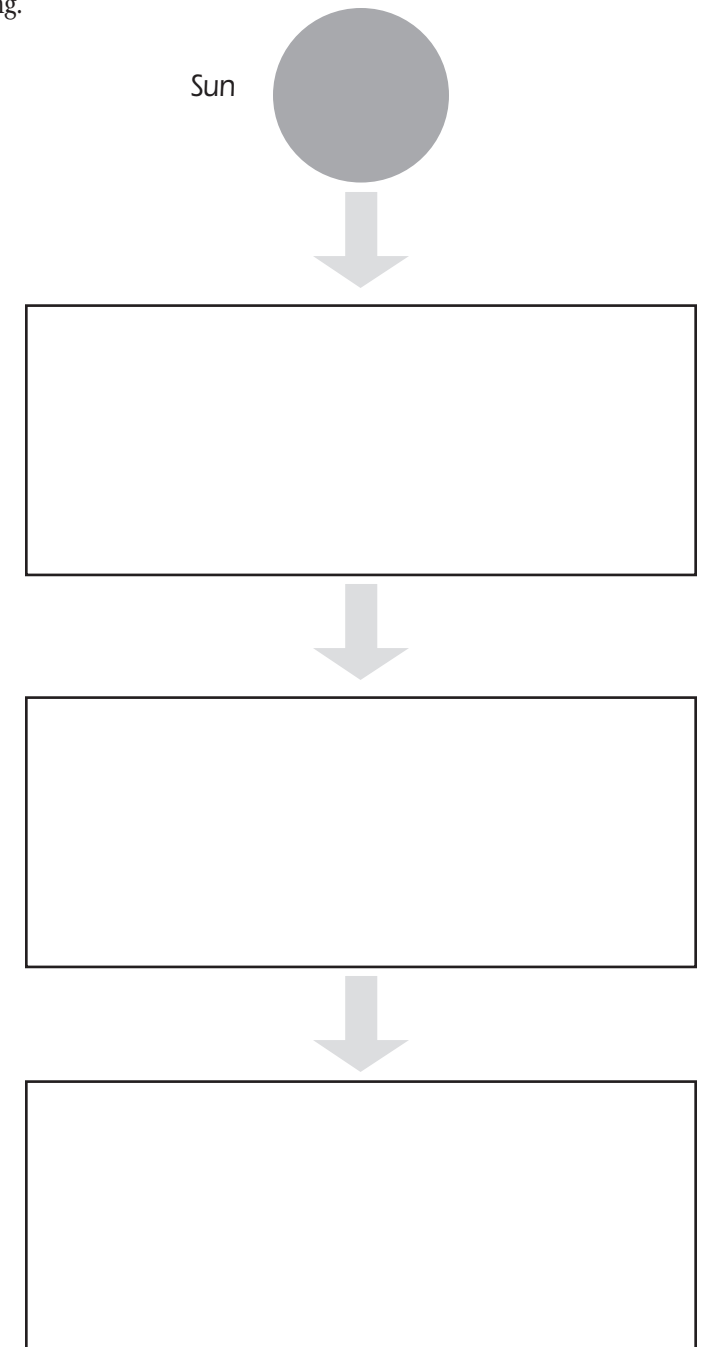
Wetlands Café – Field Data Card

Food Chain An inter-relationship in an ecological community where food energy passes among organisms. Powered by the sun, the food chain begins with plants (primary producers) and moves through a series of trophic levels, “ending” with a top predator and/or scavenger.

As a group, walk along the wetland borders and look for signs of animal life. Due to the presence of people, you will probably find less direct evidence of wildlife (seeing the animal itself) than indirect evidence (burrow holes, animal tracks, a feather, droppings, etc.). Your group may however, just quietly watch the tops of the grasses for dragonflies or look for birds in the interior of the wetland (using binoculars if they are provided). You can also examine the base of plants and the soil around them for insects. ***Do not pick up any organism that may sting or bite you.*** Once you have found a sign of an animal or observed an organism from afar, answer the following questions below:

1. What type of organism is it? *or* What organism left the sign?
2. What stage of its life cycle do you think it is in?
3. Where specifically did you find the organism or the evidence?
4. What component(s) of habitat (food, water, shelter, space) do you think the wetlands provide the animal?
5. Is your organism a predator or prey or both?

Using your organism for one of the levels (boxes) complete a wetlands food chain to which it may belong.



Dig It – Field Data Card

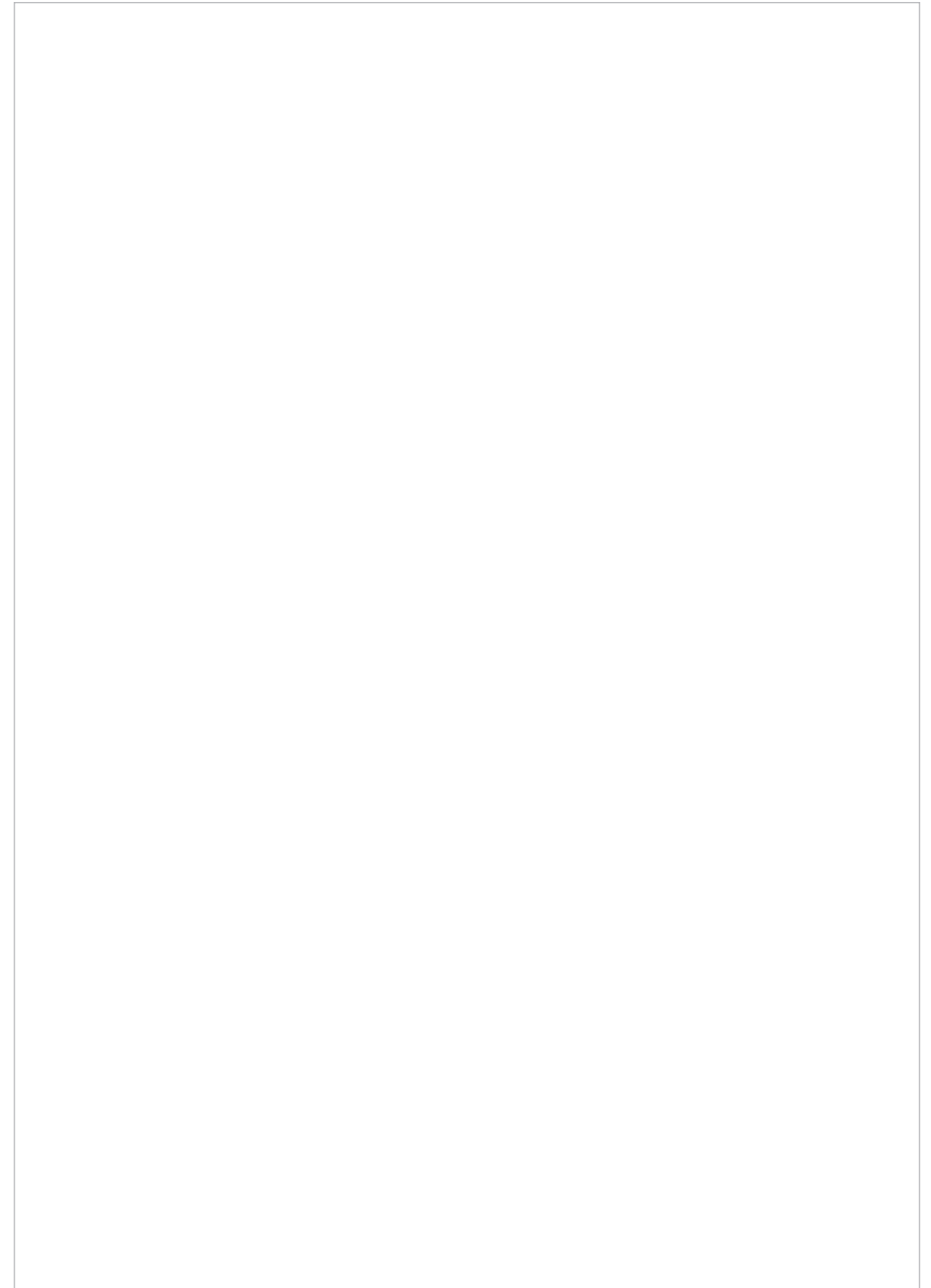
Hydric Soil soil characterized by and showing the effects of the presence of water

Your station leader will direct you to the location of a pre-made model which you can observe and measure and a sample from the site which you can touch.

As a group, complete the activities and answer the following questions using the profile provided:

1. Is the soil the same from top to bottom or are there distinct layers?
2. If there are layers, use your meter stick to measure each one and record it's length
3. Record any differences in soil color (use your wetlands soils color chart for terminology) Is there any mottled coloring?
4. Do you think this sample came from a wetlands?
5. Using the soil from the auger, pinch the soil from different layers between your fingers and feel the texture – is it rough or smooth?
6. Does the soil seem to be higher in organic matter or mineral content (sand, silt and clay) Note any differences between layers.

Please complete a basic sketch of the profile and the sample from the auger.



Go Green! – Field Data Card

Hydrophytic Plant a plant that is adapted to life in wet soil

Your station leader will direct you to the wetland transect (marked line along which scientific sampling or surveying is completed) you will use. Adjacent to the line at approximately five meter intervals will be survey flags. Each member of the team will be assigned a different study area corresponding to a flag. Note the flag number of your assigned study area so your data is entered in the appropriate box. flag number 1 will be closest to the main watercourse and flag number 5, the furthest. You will be counting the plant types in a standard hula hoop (provided by your station leader.) For example if there are five clumps of grass, three of one type and two of another, there are still five grasses. Also please use a soil moisture meter and record whether the soil in your study area is dry, wet or moist. Please note that you may need to share the meter with other students.

Use the following descriptions to answer the questions and complete your data card:

Grasses – have stems that are hollow between the joints (or nodes) and long, narrow leaves with parallel veins that come off the stem in opposite directions.

Sedges – resemble grasses but have solid stems that appear triangular in cross-section. Leaves come off the stem in three directions.

Rushes – have solid round stems.

Forbs – generally have broad leaves with net-like veins. The stems are solid or spongy and die back each year.

Woody Plants – including both shrubs (under 13 feet in height with multiple woody stems) and saplings under 13 feet in height with one main woody stem (a young tree).

<i>Plant Group</i>	Flag #1 Soil Moisture Level _____	Flag #2 Soil Moisture Level _____	Flag #3 Soil Moisture Level _____	Flag #4 Soil Moisture Level _____	Flag #5 Soil Moisture Level _____	Total
Grasses						
Sedges						
Rushes						
Forbs						
Woody Plants						

1. Using the wetlands plant key try to identify one plant in your hula hoop and list its name here.

2. Examine your teammates data and look for patterns. Were certain plants found close together? Did the distance from the main watercourse affect the plant composition?

3. Did soil moisture level appear to influence plant composition?

Field Notes Station: Is There Still Room for Wildlife?

Team member names _____

This activity should be conducted at the schoolyard either before or after the field trip to the fairgrounds, so the two sites can be compared.

Directions

Your adult chaperone will instruct you on whether your teacher would like you to complete this exercise individually or in consultation with your team members (the small groups you have been assigned to for the day.)

Both social and natural scientists rely on their senses to make field observations. At this station, you are asked to use your observation skills to record information and evaluate this site's ability to provide wildlife habitat. Habitat is the arrangement of food, water, shelter and space suitable for animals' needs. Different wildlife species have different habitat requirements. The eastern cottontail gets most of the water it needs from its food source, but a whitetail deer needs to drink where water is on the surface of the ground. While completing this habitat evaluation process, assume that the goal is to have a wide variety of mammals, birds, amphibians, reptiles, fish and insects present on the property.

To complete the habitat evaluation, rate each component on a scale of 1 (lowest or not present) to 5 (highest – abundant). Circle your responses. You will need to imagine the site during each season of the year. At the end of each section, calculate the average score for that section and list any suggestions for improvement you can make. For example, if you think the area lacks food for birds and other wildlife, a suggestion would be to plant shrubs that provide berries and nut trees.

A. Food Sources

Nuts	1	2	3	4	5
Seeds	1	2	3	4	5
Berries	1	2	3	4	5
Nectar	1	2	3	4	5
Insects	1	2	3	4	5

A. **Average Food Score:** _____

Ways to Improve:

B. Water

Green leafy plants with high water content	1	2	3	4	5
A wet area present all year	1	2	3	4	5
A wet area present part of the year	1	2	3	4	5

B. **Average Water Score:** _____

Ways to Improve:

C. Shelter

Thick brush and brambles	1	2	3	4	5
Tall grassy fields	1	2	3	4	5
Woodlands with many layers of plants	1	2	3	4	5
Streams with forested buffers	1	2	3	4	5
Dead standing trees	1	2	3	4	5
Rotting logs on the ground	1	2	3	4	5
Brush piles	1	2	3	4	5

C. **Average Shelter Score:** _____

Ways to Improve:

D. Space (natural habitats of adequate size)

Meadows	1	2	3	4	5
Forests	1	2	3	4	5
Shrubs	1	2	3	4	5
Wetlands	1	2	3	4	5
Streams	1	2	3	4	5

D. **Average Space Score:** _____

Ways to Improve:

Overall Score: (A+B+C+D divided by 4) _____

Field Notes Station: A Sense of Place

Team member names _____

Directions

Your adult chaperone will instruct you on whether your teacher would like you to complete this exercise individually or in consultation with your team members (the small groups you have been assigned to for the day.) If time permits and art materials are provided, add a sketch to illustrate your descriptions of the different time periods.

Background for Reflection

All scientists rely on their senses to make field observations. At this station, you are asked to use your observation skills to record information about what you are experiencing today. The landscape you see today is the result of natural events and human activities spread over a long period of time. For the purposes of this exercise, we will think of the Meadow as having three main historical periods or eras:

1. wilderness – before European settlement, 2. farm (recent past) and 3. its future as a special event venue.

Being located between Richmond and Washington D.C., this region has been a transportation corridor since colonial days. The town of Doswell has served as a rail station for over 150 years, playing a role in the transportation of people, agricultural and forest products. In 1864, both the Confederate and Union armies moved in and out of this area in their effort to take and defend Richmond. The Battle of North Anna was fought just a few miles away. For nearly 50 years, Interstate 95 has contributed to the sights and sounds of this landscape.

From colonial days through the 1970s, Caroline County was known for its horse farms. Triple Crown winner, Secretariat, perhaps the most famous of race horses, was born and started his training here at Meadow Farm. Today, the Meadow is the home of the State Fair of Virginia and several other special events held throughout the year. Reflect on what you think has changed and what has remained the same, during these time periods, as you complete the following observations:

The main plant communities I can see on this property are:

Do you think these communities were present when the Meadows was a working farm, yes or no, and why or why not?

When it was a wilderness?

Can you tell you are near a river, yes or no, and why or why not?

Please list 3 changes you think were made to this property while converting it to a fairgrounds?

1.

2.

3.

What sounds do you hear today?

How do you think the sounds may differ if you were sitting here ...

In 1600?

In 1864?

In 1971?

When the State Fair is going on?

Reflect on the activities of nocturnal animals. What impact do you think the State Fair has on them?

Name two other environmental impacts the Fair may have on this natural site?

List two design elements you think were used to help lessen those impacts?

What other suggestions do you have for conserving natural resources?

How does this place make you feel?

Student Water Quality Testing Data Card

Team member names _____

pH, Dissolved Oxygen (DO) and Temperature

Temperature: _____ °C

In general does the temperature seems exceedingly hot or cold for this time of year and place? If so, what might be causing the temperature change?

DO: _____ ppm _____ % of saturation (see graph on page 2 of this journal)

Is the level of DO appropriate for supporting aquatic life? If not, what might be affecting the level of DO?

pH: _____

Is the pH of the water in the appropriate range for aquatic life? If not, is the water too acidic or too basic? Is there any evidence of what might be changing the pH?

Based on the results of the three tests do you think this is a healthy stream that adequately supports aquatic life? Why or why not?

How can we protect streams and rivers so they have appropriate levels of DO, pH and temperatures?

Why is it important to protect streams and rivers?

